

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: A. KOVACS, et al
Serial No.: Not yet assigned
Filed: August 20, 2001
For: RELOCATION METHOD, SYSTEM AND NETWORK ELEMENT

Group: Not yet assigned
Examiner: Not yet assigned

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents August 20, 2001
August 20, 2001
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows.

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A relocation method for changing a serving radio resource control entity, said method comprising the steps of:

a) establishing a first operating state in which a user equipment has radio links with a serving network element

in charge of radio resource control of said user equipment.
and with a drift network element supporting said serving
network element with a wireless connection to said user
equipment ;

b) transmitting a relocation-specific information
from said serving network element to a target network element
which is going to be the next serving radio resource control
entity;

c) establishing based on said relocation-specific
information a second operating state in which said user
equipment has radio links with said drift network element
and said target network element, and in which said drift
network element supports said target network element with a
user traffic connection to said user equipment and receives
user traffic from both said serving network element and said
target network element ; and

d) relocating said radio resource control to said
target network element when said second operating state has
been established.

2. (Amended) A method according to claim 1, wherein an
lur interface is established between said drift network element
and both said serving network element and said target network

element .

3. (Amended) A method according to claim 1, wherein said relocation-specific information is transmitted in a relocation request message.

4. (Amended) A method according to claim 3, wherein said relocation request message is a RANA Relocation Request message transmitted to an access server or point of a core network.

5. (Amended) A method according to claim 3, wherein said relocation request message is directly transmitted to said target network element.

6. (Amended) A method according to claim 3, wherein said relocation request message comprises an identification of said target network element and said drift network element.

7. (Amended) A method according to claim 1, wherein said entity change comprises a soft handover procedure.

8. (Amended) A method according to claim 1, wherein

said establishing step c) of said second operating state comprises the steps of:

c1) transmitting a drift setup message from said target network element to said drift network element;

c2) initiating an uplink bi-casting procedure at said drift network element to said serving network element and said target network element;

c3) initiating a downlink bi-casting procedure from a core network access point to said serving network element and said target network element, or a downlink transport forwarding procedure from said serving network element to said target network element; and

c4) initiating a handover of said user equipment from said serving network element to said target network element.

9. (Amended) A method according to claim 1, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

10. (Amended) A method according to claim 4, wherein said relocation specific information comprises identifications of multiple drift network elements to which a connection is to be established by said target network element.

12. (Amended) A relocation system for changing a serving radio resource control entity, said system comprising:

a) a serving network element for transmitting a relocation-specific information to a target network element which is going to be the next serving radio resource control entity, said serving network element being in charge of radio resource control of a user equipment; and

b) a drift network element for supporting said serving network element with a wireless connection to said user equipment;

c) wherein said target network element is arranged to establish, in response to the receipt of said relocation-specific information, a link to said drift network element and to initiate a downlink bi-casting procedure to said serving network element and said target network element

or a downlink transport forwarding procedure from said serving network element to said target network element ; and

d) wherein said system is arranged to change said radio resource control to said target network element after said initiation of said bi-casting or forwarding procedure.

14. (Amended) A system according to claim 12, wherein said serving network element, said drift network element and/or said target network element are base transceiver stations, base station controllers or radio network controllers, or a combination thereof.

15. (Amended) A system according to claim 12, wherein said link to said drift network element comprises an lnr interface.

16. (Amended) A system according to claim 12, wherein said target network element is arranged to establish links to multiple drift network elements based on an identification in said relocation-specific information.

17. (Amended) A network element for handling radio resource control in a radio access network, comprising:

a) means for receiving a relocation-specific information;

b) means for establishing, in response to the receipt of said relocation-specific information, a link to a drift network element specified by said relocation-specific information; and

c) means for initiating a downlink bi-casting procedure to said network element and to a serving network element to be subjected to relocation, or a downlink transport forwarding procedure from said serving network element to said network element .

19. (Amended) A network element for handling radio resource control in a radio access network, comprising:

a) means for adding an identification information to a relocation-specific information, said identification information identifying a drift network element supporting said network element in serving a user equipment; and

b) means for transmitting said relocation-specific information to a target network element to which radio resource control of said user equipment is to be relocated.

Please add new claims 21-46 as follows:

-- 21. A method according to claim 2, wherein said relocation-specific information is transmitted in a relocation request message.

22. A method according to claim 4, wherein said relocation request message comprises an identification of said target network element and said drift network element.

23. A method according to claim 5, wherein said relocation request message comprises an identification of said target network element and said drift network element.

24. A method according to claim 2, wherein said entity change comprises a soft handover procedure.

25. A method according to claim 3, wherein said entity change comprises a soft handover procedure.

26. A method according to claim 4, wherein said entity change comprises a soft handover procedure.

27. A method according to claim 5, wherein said entity change comprises a soft handover procedure.

28. A method according to claim 6, wherein said entity change comprises a soft handover procedure.

29. A method according to claim 2, wherein said establishing step c) of said second operating state comprises the steps of:

c1) transmitting a drift setup message from said target network element to said drift network element;

c2) initiating an uplink bi-casting procedure at said drift network element to said serving network element and said target network element;

c3) initiating a downlink bi-casting procedure from a core network access point to said serving network element and said target network element, or a downlink transport forwarding procedure from said serving network element to said target network element; and

c4) initiating a handover of said user equipment from said serving network element to said target network element.

30. A method according to claim 3, wherein said establishing step c) of said second operating state comprises the steps of:

c1) transmitting a drift setup message from said

target network element to said drift network element;

c2) initiating an uplink bi-casting procedure at said drift network element to said serving network element and said target network element;

c3) initiating a downlink bi-casting procedure from a core network access point to said serving network element and said target network element, or a downlink transport forwarding procedure from said serving network element to said target network element; and

c4) initiating a handover of said user equipment from said serving network element to said target network element.

31. A method according to claim 4, wherein said establishing step c) of said second operating state comprises the steps of:

c1) transmitting a drift setup message from said target network element to said drift network element;

c2) initiating an uplink bi-casting procedure at said drift network element to said serving network element and said target network element;

c3) initiating a downlink bi-casting procedure from a core network access point to said serving network element and said target network element, or a downlink transport

forwarding procedure from said serving network element to said target network element; and

c4) initiating a handover of said user equipment from said serving network element to said target network element.

32. A method according to claim 5, wherein said establishing step c) of said second operating state comprises the steps of:

c1) transmitting a drift setup message from said target network element to said drift network element;

c2) initiating an uplink bi-casting procedure at said drift network element to said serving network element and said target network element;

c3) initiating a downlink bi-casting procedure from a core network access point to said serving network element and said target network element, or a downlink transport forwarding procedure from said serving network element to said target network element; and

c4) initiating a handover of said user equipment from said serving network element to said target network element.

33. A method according to claim 16, wherein said establishing step c) of said second operating state comprises

the steps of:

c1) transmitting a drift setup message from said target network element to said drift network element;

c2) initiating an uplink bi-casting procedure at said drift network element to said serving network element and said target network element;

c3) initiating a downlink bi-casting procedure from a core network access point to said serving network element and said target network element, or a downlink transport forwarding procedure from said serving network element to said target network element; and

c4) initiating a handover of said user equipment from said serving network element to said target network element.

34. A method according to claim 7, wherein said establishing step c) of said second operating state comprises the steps of:

c1) transmitting a drift setup message from said target network element to said drift network element;

c2) initiating an uplink bi-casting procedure at said drift network element to said serving network element and said target network element;

c3) initiating a downlink bi-casting procedure from

a core network access point to said serving network element and said target network element, or a downlink transport forwarding procedure from said serving network element to said target network element; and

c4) initiating a handover of said user equipment from said serving network element to said target network element.

35. A method according to claim 2, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

36. A method according to claim 3, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

37. A method according to claim 4, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

38. A method according to claim 5, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

39. A method according to claim 6, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

40. A method according to claim 7, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

41. A method according to claim 8, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element to switch over its radio resource control interface from said serving network element to said target network element;

d2) stopping bi-casting or forwarding to said serving network element after said switch over; and

d3) releasing said radio resource control connection at said serving network element.

42. A method according to claim 5, wherein said relocation specific information comprises identifications of multiple drift network elements to which a connection is to be established by said target network element.

43. A method according to claim 6, wherein said relocation specific information comprises identifications of multiple drift network elements to which a connection is to be established by said target network element.

44. A system according to claim 13, wherein said serving network element, said drift network element and/or said target network element are base transceiver stations, base

station controllers or radio network controllers, or a combination thereof.

45. A system according to claim 13, wherein said link to said drift network element comprises an lur interface.

46. A system according to claim 14, wherein said link to said drift network element comprises an lur interface.--

REMARKS

Attached hereto is a marked-up copy version of the changes made to the claims by the current Amendment. The attached page is captioned "Version with markings to show changes made".

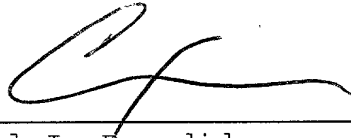
Entry of the above amendments prior to examination is respectfully requested.

Please charge any shortage in fees due in connection with the filing of this paper, or credit any overpayment of fees,

to the deposit account of Antonelli, Terry, Stout & Kraus,
LLP, Deposit Account No. 01-2135 (1120.40545X--).

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A relocation method for changing a serving radio resource control entity, said method comprising the steps of:

a) establishing a first operating state in which a user equipment ~~(30)~~ has radio links with a serving network element ~~(20)~~ in charge of radio resource control of said user equipment. and with a drift network element ~~(21)~~ supporting said serving network element ~~(20)~~ with a wireless connection to said user equipment ~~(30)~~;

b) transmitting a relocation-specific information from said serving network element ~~(20)~~ to a target network element ~~(22)~~ which is going to be the next serving radio resource control entity;

c) establishing based on said relocation-specific information a second operating state in which said user equipment ~~(30)~~ has radio links with said drift network element ~~(21)~~ and said target network element ~~(22)~~, and in which said drift network element ~~(21)~~ supports said target network element ~~(22)~~ with a user traffic connection to said user equipment and receives user traffic from both said serving network element ~~(20)~~ and said target network element ~~(22)~~; and

d) relocating said radio resource control to said target network element ~~(22)~~ when said second operating state has been established.

2. (Amended) A method according to claim 1, wherein an lur interface is established between said drift network element (21) and both said serving network element (20) and said target network element (22).

3. (Amended) A method according to claim 1 ~~any one of the preceding claims~~, wherein said relocation-specific information is transmitted in a relocation request message.

4. (Amended) A method according to claim 3, wherein said relocation request message is a RANA Relocation Request message transmitted to an access server or point (10) of a core network.

5. (Amended) A method according to claim 3, wherein said relocation request message is directly transmitted to said target network element (22).

6. (Amended) A method according to claim 3 ~~any one of claims 3 to 5~~, wherein said relocation request message comprises an identification of said target network element (22) and said drift network element (21).

7. (Amended) A method according to claim 1 ~~any one of the preceding claims~~, wherein said entity change comprises a soft handover procedure.

8. (Amended) A method according to claim 1 ~~any one of the preceding claims~~, wherein said establishing step c) of said second operating state comprises the steps of:

c1) transmitting a drift setup message from

said target network element (22) to said drift network element (21);

c2) initiating an uplink bi-casting procedure at said drift network element (21) to said serving network element (20) and said target network element (22);

c3) initiating a downlink bi-casting procedure from a core network access point to said serving network element (20) and said target network element (22), or a

downlink transport forwarding procedure from said serving network element (20) to said target network element (22); and

c4) initiating a handover of said user equipment (30) from said serving network element (20) to said target network element (22).

9. (Amended) A method according to claim ~~1 any one of the preceding claims~~, wherein said relocation step d) comprises the steps of:

d1) instructing said drift network element (21) to switch over its radio resource control interface from said serving network element (22) to said target network element (22);

d2) stopping bi-casting or forwarding to said serving network element (20) after said switch over; and

d3) releasing said radio resource control connection at said serving network element (20).

10. (Amended) A method according to claim ~~4 any one of Claims 4 to 6~~, wherein said relocation specific information comprises identifications of multiple drift network elements (20, 21) to which a connection is to be established by said target network element (22).

12. (Amended) A relocation system for changing a serving radio resource control entity, said system comprising:

a) a serving network element (20) for transmitting a relocation-specific information to a target network element (21) which is going to be the next serving radio resource control entity, said serving

network element ~~(20)~~ being in charge of radio resource control of a user equipment ~~(30)~~; and

b) a drift network element ~~(21)~~ for supporting said serving network element ~~(20)~~ with a wireless connection to said user equipment ~~(30)~~;

c) wherein said target network element ~~(22)~~ is arranged to establish, in response to the receipt of said relocation-specific information, a link to said drift network element ~~(21)~~ and to initiate a downlink bi-casting procedure to said serving network element ~~(20)~~ and said target network element ~~(22)~~ or a downlink transport forwarding procedure from said serving network element ~~(20)~~ to said target network element ~~(22)~~; and

d) wherein said system is arranged to change said radio resource control to said target network element ~~(22)~~ after said initiation of said bi-casting or forwarding procedure.

14. (Amended) A system according to claim 12 ~~or 13~~, wherein said serving network element ~~(20)~~, said drift network element ~~(21)~~ and/or said target network element ~~(22)~~ are base transceiver stations, base station controllers or radio network controllers, or a combination thereof.

15. (Amended) A system according to claim ~~any one of claims 12 to 14~~, wherein said link to said drift network element ~~(21)~~ comprises an lnr interface.

16. (Amended) A system according to claim ~~any one of claims 12 to 15~~, wherein said target network element ~~(22)~~ is arranged to establish links to multiple drift network elements ~~(20, 21)~~ based on an identification in said relocation-specific information.

17. (Amended) A network element for handling radio resource control in a radio access network, comprising:

a) means for receiving a relocation-specific information;

b) means for establishing, in response to the receipt of said relocation-specific information, a link to a drift network element ~~(21)~~ specified by said relocation-specific information; and

c) means for initiating a downlink bi-casting procedure to said network element ~~(22)~~ and to a serving network element ~~(20)~~ to be subjected to relocation, or a downlink transport forwarding procedure from said serving network element ~~(20)~~ to said network element ~~(22)~~.

19. (Amended) A network element for handling radio resource control in a radio access network, comprising:

a) means for adding an identification information to a relocation-specific information, said identification information identifying a drift network element ~~(21)~~ supporting said network element ~~(20)~~ in serving a user equipment ~~(30)~~; and

b) means for transmitting said relocation-specific information to a target network element ~~(22)~~ to which radio resource control of said user equipment ~~(30)~~ is to be relocated.